

CLAIMS

What is claimed is:

1. An interactive book reading system (600) responsive to a human finger presence, the system comprising:

(a) a radio frequency (RF) scanning circuit (675) configured to detect the presence of a human finger when the finger enters an RF field generated by the RF scanning circuit (675);

(b) a control circuit (610) in communication with the RF scanning circuit (675);

(c) a memory (615) in communication with the control circuit (610), the memory (615) storing a plurality of audible messages; and

(d) an audible output device (650) in communication with the control circuit (610), wherein the audible output device (650) outputs at least one of the audible messages based on an analysis of the RF field performed by the control circuit (610) when the finger enters the RF field.

2. The system of claim 1 wherein the RF scanning circuit (675) comprises a matrix (630) of conductive lines arranged as a plurality of spaced apart column conductive lines and a plurality of spaced apart row conductive lines transverse to the plurality of column conductive lines, wherein for each specific column conductive line:

(i) an RF signal is input into the specific column conductive line according to a predetermined input sequence as directed by a first coordinated control signal (655) outputted by the control circuit (610), and

(ii) coupled RF signals received from the specific column conductive line by the plurality of row conductive lines are outputted according to a predetermined output sequence as directed by a second coordinated control signal (660) outputted by the control circuit (610).

3. The system of claim 2 wherein the RF scanning circuit (675) further comprises an RF oscillator (620) which generates the RF signal that is input into the specific column conductive line.

4. The system of claim 3 wherein the RF scanning circuit (675) further comprises an input switching circuit (625) in communication with the control circuit (610), the RF oscillator (620) and the column conductive lines of the matrix (630), the input switching circuit (625) receiving the first coordinated control signal (655) from the control circuit (610) and the RF signal generated by the RF oscillator (620), the input switching circuit (625) sequentially routing the RF signal generated by the RF oscillator (620) to each of the column conductive lines according to the predetermined input sequence.

5. The system of claim 3 wherein the RF scanning circuit (675) further comprises an output switching circuit (635) in communication with the control circuit (610) and the row conductive lines of the matrix (630), the output switching circuit (635) receiving the second control signal (660) from the control circuit (610) and the coupled RF signals, the output switching circuit (635) sequentially outputting the RF coupled signals according to the predetermined output sequence.

6. The system of claim 2 wherein the RF scanning circuit (675) further comprises a bandpass processing circuit (640) in communication with the control circuit (610) and the matrix (630), the bandpass processing circuit (640) amplifying and filtering the coupled RF signals, and routing the amplified and filtered coupled RF signals to the control circuit (610) for analysis.

7. The system of claim 6 wherein the amplified and filtered coupled RF signals are AC voltage sine wave signals.

8. The system of claim 6 further comprising an AC to DC converter (645) in communication with the control circuit (610) and the bandpass processing circuit (640), wherein the AC to DC converter (645) transforms a peak of the amplified and filtered coupled RF signals to DC level signals.

9. The system of claim 6 wherein the bandpass processing circuit (640) includes a bandpass filter and a bandpass amplifier.

10. The system of claim 2 wherein the RF signal has a frequency of approximately 100 kHz.

11. The system of claim 2 wherein the amplitude of the RF signal is approximately 18 VAC.

12. The system of claim 2 wherein the column conductive lines and row conductive lines are separated by an electrically insulative sheet.

13. The system of claim 1 wherein the control circuit (610) includes a microcontroller.

14. A method of using an interactive book reading system (600) responsive to the presence of a human finger, the method comprising the steps of:

(a) detecting the human finger as the finger enters an RF field generated by the reading system (600);

(b) storing a plurality of audible messages; and

(c) outputting at least one of the audible messages based on an analysis of the RF field when the finger enters the RF field.

15. The method of claim 14 wherein the reading system (600) includes a matrix (630) of conductive lines arranged as a plurality of spaced apart column conductive lines and a plurality of spaced apart row conductive lines transverse to the plurality of column conductive lines, and step (a) further comprises:

(a)(i) inputting an RF signal into a specific one of the plurality of column conductive lines according to a predetermined input sequence;

(a)(ii) outputting coupled RF signals received from the specific column conductive line by the plurality of row conductive lines according to a predetermined output sequence; and

(a)(iii) repeating steps (a)(i) and (a)(ii) for each of the column conductive lines.

16. The method of claim 15, further comprising analyzing one or more electrical characteristics of the coupled RF signals after an RF signal is input into all of the column conductive lines.

17. The method of claim 15, further comprising:

- (d) amplifying and filtering the coupled RF signals; and
- (e) transforming a peak of the amplified and filtered coupled RF signals to DC level signals.